

SEQUENCE LISTING

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<120> RETROVIRAL EXPRESSION VECTORS ON THE BASIS OF
HERV-LONG TERMINAL REPEAT SEQUENCES

<130> 10737-006001

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<151> 1999-03-10

<160> 47

<170> PatentIn Ver. 2.1

<210> 1

<211> 375

<212> DNA

<213> Human endogenous retrovirus

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<400> 3

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<213> Human endogenous retrovirus

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<210> 6
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<213> Human endogenous retrovirus

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<210> 7
<211> 393
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<213> Human endogenous retrovirus

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<400> 7

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ctgcccacca gagaacaacc ccctttgact gtaattttcc attaccttcc caaatcctat 300
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<210> 8

<211> 393

<212> DNA

<213> Human endogenous retrovirus

<400> 8

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ctgcccacca gagaacagac ccctttgact gtaattttcc attaccttcc caaatcctat 300
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<210> 9

<211> 388

<212> DNA

<213> Human endogenous retrovirus

<400> 9

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attccaccat tgtgatttggt ttctgcccc aacctactga tcaatgtact ttgtaatctc 180
tcccaccctt aagaagggtt tttgtaattc tccccaccct tgagagtgtc ctttgtgaga 240
tccaccctt gccggcaaaa cattgctcct aacccaaccg cctaccccaa acctgtaaga 300
actaatgata atccaccacc ctttgtgtgac tcttttcaga atcagcccg cgtcacccag 360
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<210> 10

<211> 314

<212> DNA

<213> Human endogenous retrovirus

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attccaccat tgtgatttggt tctgcccc aacctactga taccatata tcttcccccg 180
cccttgagaa tgtactttgt acacctatcc caaacctata agaactaatg ataatectac 240
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<210> 11

<211> 309

<212> DNA

<213> Human endogenous retrovirus

<400> 11

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caccattgtg atttgttcct gccccacgt aactgatacc atatattctt cccccgcct 180
tgagaatgta ctttgtacac ctatcccaaa cctataagaa ctaatgataa tccaccaccc 240
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<210> 12

<211> 314

<212> DNA

<213> Human endogenous retrovirus

<400> 12

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attccaccat tgtgatttgt tcctgcccta cgctagctga taccatatat tcttcccccg 180
cccttgagaa tgtactttgt acacctatcc caaacctata agaactaatg ataatoctac 240
caccctttgc tgactctctt tttggactca gccgcctgc acccaggtga aataaacacg 300
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<210> 13

<211> 341

<212> DNA

<213> Human endogenous retrovirus

<400> 13

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ctaagcctag ctgggaaggt gaccgcatcc acctttaaac acggggctcg caacttagct 120
cacacccaac caatcaggta gtaaagaggg ctactaaaa tgctaattag gcaaagacag 180
gaggtaaaga aatagccaat catctattgc ctgagagcac agcaggaggg acaatgatcg 240
ggatataaac ccaagtcttc gagccggcaa tggctacett ctttgggtcc cctccctttg 300
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<210> 14

<211> 341

<212> DNA

<213> Human endogenous retrovirus

<400> 14

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ctaagcctag ctgggaaggt gaccgcatcc atctttaaac atggggcttg caacttaact 120
catatctgac caatcaggta gtaaagagag ctactaaaa tgctaattag gctaaaacag 180
gaggcaaaga agtagccaat catctgttgc ctgacagcac agcaggaggg acaatgatcg 240
ggatataaac ccaggcattc gagccagcta cagctaccct ctttgggtcc cctccctttg 300
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<210> 15

<211> 322

<212> DNA

<213> Human endogenous retrovirus

<400> 15

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cacacttgac cagtcaggta gtaaagagag ctactaaaa tgctaattag gctaaaacag 180
gaggtaaaga aatagacaat catctatcac ctgagagcac agtgggaggg acaatgatcg 240
gcatataaac ccaggcattc gagccagcaa cagcaacccc ctttgggagc tctgttttca 300
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<210> 16

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 16

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cacacccaac caatcaggta gtaaagagag cttgctaaaa tgctaattag gcaaaaacag 180
gaggtaaaga aatagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
ggatataaac tcaggcattc aagccagcaa tggctaccca ctttgggtcc cctcccattt 300
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<210> 17

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 17

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catacccaac aaatcaggta gtaaagagag ctactaaaa tactgattag gcgaaaacag 180
gaggtaaagga aacagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
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<210> 18

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 18

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gaggtaaaga agtagccaat catctatcgc ctgagagcac aacaggaggg acaatgatca 240
ggatataaac ccaggcattc aagccagcgg tggctacctt ctttgggtcc cctccccttg 300
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<210> 19

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 19

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ggatataaac ccaggcattc aagccagcgg tggctaccct ctttgggtcc cctccctttg 300
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<210> 20

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 20

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cacacccgac caatcaggta gtaaagagag cttgctaaaa tgctaattag gcaaaaacag 180
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ggatataaac ccaagcattc gagccagcaa tggctaccct ctttgtgtcc cctccctttg 300
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<212> DNA

<213> Human endogenous retrovirus

<400> 21

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catatctgac caatcaggta gtaaagagag cttgctaaaa tgctaattag gcaaaaacag 180
gaggtaaaga aatagccagt catctatcgc ctgacagcac aaggggcggg acaatgatca 240
ggatataaac tcaggcattc aagccagcaa tggctaccga ctttgggtcc cctcccattt 300
tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 22

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 22

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tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 23

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 23

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cacacccgac caatcaggta gtaaaggag ctcactaaaa tgctaattag ggaaaaacag 180
gaggtaaaga agtagccaat catctatcgc ctgagagcac aacaggaggg acaatgatca 240
ggatataaac ccaggcattc aagccagcgg tggctaccct ctttgggtcc cctccctttg 300
tatggaagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 24

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 24

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ggatataaac ccaggcattc gagccggcaa cgactaccct ctttgggtcc cctccctttg 300
tatgggagct ctgttttcac tctattaaat cttgcaactg caa 343

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<210> 25

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 25

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gaggtaaaga aatagccagt catctatcgc ctgacagcac aaggggaggg acaatgatca 240
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<210> 26

<211> 343

<212> DNA

<213> Human endogenous retrovirus

<400> 26

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gaggtaaaga aatagccaat catctattgc ctgagagcac agcgggaggg acaatgatca 240
ggatataaac ccaggcattc gagccggcaa cgactaccct ctttgggtcc cctccctttg 300
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<210> 27

<211> 619

<212> DNA

<213> Human endogenous retrovirus

<400> 27

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gattaacaga atctcaaggc agaagaattt ttcttaacac ataacaaaat ggagtctccc 540
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<210> 28
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<212> DNA
<213> Human endogenous retrovirus

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<400> 28
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ttgtctcaac tgcaagaggc attccttcct cttatactaa tcctcctcag cacagaccct 180
ttacgggtgt cgggctgggg gacggtcagg tctttccctt cccacgaggc catatttcag 240
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tcaaccctga gttgacacag cacacgtttc agagagcacg gggttggggg taaggtcata 480
gattaacaga atctcaaggc agaagaattt ttcttaacac ataacaaaat ggagtctccc 540
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tttccccctt ttcttttcga                                     620

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<210> 29
<211> 624
<212> DNA
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<400> 29
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ttgtctcaac tgcaagaggc attccttcct cttatactaa tcctcctcag cacagaccct 180
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gccttcgcga gtttttgtgt cctgggtact tgagattagg gagtgggtgat gactcttaag 360
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tttccccctt ttcttttcga caaa                                     624

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<210> 30
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<212> DNA
<213> Human endogenous retrovirus

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<400> 30
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cggggttttat accgagacat tccattgccc agggacaggc aggagacaga tgccttcctc 120
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actatcacat ggggagaaac cttggacaat acctggcttt cctaggcaga ggtccctgcg 300
gccttcgcga gtttttgtgt cctgggtact tgagattagg gagtgggtgat gactcttaag 360
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atgtctactt ctttctacac agacacagta acaatctgat ctctcttgct tttccccaca 600
tttccccctt ttcttttctg caaaaccgcc atctcgagat ctgagt 646

```

```

<210> 31
<211> 672
<212> DNA
<213> Human endogenous retrovirus

```

```

<400> 31
gtcccacctc cagccctaag gcgggtttttc cctatctcag tagatggagc atacaatcgg 60
gttttataacc gagacattcc attgcccagg gacaggcagg agacagatgc ctctctcttg 120
tctcaactgc aagaggcatt ccttctctct atactaatcc tcctcagcac agacccttta 180
cgggtgtcgg gctggggggc ggtcaggctt ttccttctcc acgaggccat atttcagact 240
atcacatggg gagaaacctt ggacaatacc tggttttctt aggcagaggc ccctgcggcc 300
ttcgcagtt tttgtgtcct ggggtacttg gattagggag tggatgatgac tcttaaggag 360
catgctgcct tcaagcatct gttaacaag gcacatcctg caccgccctt aatccattca 420
acctgagtt gacacgcac acgtttcaga gagcacgggg ttgggggtaa ggtcatagat 480
taacagaatc tcaaggcaga agaatttttc ttaacacata acaaaatgga gtctcccatg 540
tctacttctt tctacacaga cacagtaaca atctgatccc tcttgctttt cccacattt 600
cccccttttc ttatccatca cactggcggc cgctcgagca tgcatctaga gggcccaatt 660
cgccctatag tg 672

```

```

<210> 32
<211> 593
<212> DNA
<213> Human endogenous retrovirus

```

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<400> 32
agtagatgga gcatacaatc ggggttttata ccgagacatt ccattgcccga gggacaggca 60
ggagacagat gccttctctt tgtctcaact gcaagaggca ttcttctctt ttttactaat 120
cctctcagc acagaccctt tacagggtgtc gggctggggg acggtcaggc ctttcccttc 180
ccacgaggcc atatttcaga ctatcacatg gggagaaacc ttggacaata cctggctttc 240
ctaggcagag gtccctgcgg ccttctgcag tttttgtgtc cctgggtact tgagattagg 300
gagtgggtgat gactcttaag gagcatgctg ccttcaagca tctgtttaac aaagcacatc 360
ctgcaccgcc cttaatccat tcaaccctga gttgacacag cacatgtttc agagagcacg 420
gggttggggg taaggtcata gattaacaga atctcaaggc agaagaattt ttcttagcac 480
ataacaaaat ggagtctctt atgtctactt ctttctacac agacacagta acaatttgat 540
ctctcttgct tttccccaca tttccccctt ttcttttctg caaaaccgcc atc 593

```

```

<210> 33
<211> 943
<212> DNA
<213> Human endogenous retrovirus

```

```

<400> 33
tgtgggagaa ggattacca ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60

```

```

ataatataga aaatagctag aataagaata gttataataa aaattagata tacacatgat 120
catggacatt accaatcatt actacaaaca ttgttaatca ttagctttta atattactct 180
ttgtttttatt actaatataa ccaaggaata accggttagca tacggtcagg tgctgaaggg 240
acattgtgag aagtgaacct gaaggcaaga ggtgagcctt ctgtcacgcc tgcataagga 300
cagcttgagg gtccttgggt caagctgtaa caccagtgcc tgggaaggca ccgttactta 360
gcagaccatg aaagggagtc tccattcctt ggaggagtca gggaaacct atgctccacc 420
agcttcttgt gtatccagcc ctgcccacag tcatccagag gcataaaccc ctccctgtgg 480
tgctgtgctt caatggccat gcttcttgtc cactttcatg ttctcctgt actcctggtt 540
cctctttgaa gttcgtagaa gataatggta gaagaaatag tgaaagtctt tgatctttct 600
tataagtgca tagaagaaaa cactgatgta tgctgcctt cctctctgc ttcagctacc 660
taaaaggaaa ggcccccttt cccatgatca catgacttgc ctgaccttat caatcacttg 720
gaggactcac cctccttacc ctgtcccttt gtcttgtatg caataaatat cagcacgccc 780
agccattcgg ggccactact ggtctccgca acttggtggt agtggtaccc tggggccagc 840
tgttttctct ttatctcttt tgtcttgtgt ctttatttct tacaatctct catctctgca 900
catggggaga acaccggcaa agcccgtagg gctggacctt aca 943

```

<210> 34

<211> 389

<212> DNA

<213> Human endogenous retrovirus

<400> 34

```

aaacccctcc ctgtggtgct gtgcttcaat ggccatgctt cttgtccact ttcatgttcc 60
tctgtacttc ctggttccctc tttgaagttc gtagaagata atggtagaag aaatagttaa 120
agtctttgat ctttcttata agtgcataga agaaaacct gatgtatgcc tgccttccct 180
ctctgcttca gctacctaaa aggaagggcc cctttccca tgatcacatg acttgctga 240
ccttatcaat cacttgagg actcacctc cttaccctgt ccttttgtct tgtatgcaat 300
aaatatcagc acgcccagcc attcggggcc actactggtc tccgcaactt ggtggtagtg 360
gtaccctggg ccagctggtt ttctcttta 389

```

<210> 35

<211> 858

<212> DNA

<213> Human endogenous retrovirus

<400> 35

```

tgtgggcgga agagtaccta ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagaata agaatagtca taatacaaat tagatacagc gatgatcatg 120
aacaattatc catcattatt ataaacatta ttaatcatta gcttttaata ttactctgtt 180
gcattaataa tataacctag gaataaccgg caggtatagg gtcagggtgct gaagggacat 240
tgtgagaagt gaatagaagg caagagggga gccttctgtc atgcccgcac aagggccgct 300
tgagggcccc ttggtcaagc ggtaacgcca gtgtctggga aggcacccgt tactgagcag 360
accgggaaag ggagtctcct ttccttgagg gagtcaggga acgctctgct ccaccagctt 420
cttgtgggag gctggatggt acccaggcct gcctgcagtc atccggaggc ctgaaccctt 480
ccctgtggtg cttcaatggt cagtttccct gtccactttc atgtccttc cgtactcctg 540
gttctctctt gaagttcgta gtagatagcg gtagaagaaa tagtgaaagt cttaaagtct 600
ttgatcttat aagttcatag aagaaaacgc tgatgcctgc cgccttctct ctctgcttca 660
gctacctaa agggaagggc ccgctgtcct gtgatcagg gacttgcttc acctgtcaa 720
tcacttagaa gactgacct cttatcctg ccccttctgc ttgtatgcaa taaatatcag 780
cgagcccagc cgttcagggc cactaccggt ctccgtgtct ttgtggtagt ggtccccggg 840
cccagctggt ttctcttt 858

```

<210> 36

<211> 386

<212> DNA

<213> Human endogenous retrovirus

<400> 36

```

gaacccctcc ctgtggtgct tcaatggtca cgttccttgt ccactttcat gtcctttccg 60
tactcctggt tcctctttga agttcgtagt agatagcggt agaagaaata gtgaaagtct 120
taaagtcttt gatcttataa gtccatagaa gaaaacgctg atgcctgccg ccttctctct 180
ctgcttcagc tacctaagag ggaaggggccc gctgtcctgt gatcagggtga cttgcttcac 240
cttgtcaatc acttagaaga ctgacctcc ttatcctgcc cccttgtctt gtatgcaata 300
aatatcagcg agcccagccg ttcaggggcca ctaccgggtct ccgtgtcttt gtggtagtgg 360
tccccggggc cagctgtttt ctctttt                                     386

```

<210> 37

<211> 844

<212> DNA

<213> Human endogenous retrovirus

<400> 37

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tgtgggtgga ggattaccca ggtgccaaagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaaa aaatagaata agaatagtca taatacaaat tagatataga gatgatcatg 120
gacaattagc aatcactatt aatcttttagc ttttaatat actctttgtt gcattactaa 180
tataacctag gaataaccgg tgggtatagg gtcagggtgct gaagggacat tgtgtgaagt 240
gacctggaag gcaagagggtg agccctctgt cacgcccaca taaggggccgc ttgagggtc 300
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gctacctaaa agggaagggc cgcctatcct gtaatcacat gacttgcttc acctgtcaa 720
tcacttagaa gattcactct ccttaccctg ccccttggtc ttgtatgcaa taaatatcag 780
tgaccccagc cgttcagggc cactactggt ctccgcgtct tgatggtagt ggtcaccgcc 840
gcc                                     844

```

<210> 38

<211> 381

<212> DNA

<213> Human endogenous retrovirus

<400> 38

```

aaacccttcc ctgtggtgct gtgcttcaat ggtcccactc cttgtccact ttcatgctcc 60
tcccgtaact ctggttcttc tttgaagagc gcagtagata gcggtagaag aaatagtga 120
agtcttaaag tcttcgatct ttcttacaag tgcagagaag aaaacgctga catatgctgc 180
cttccctctc tgcttcggct acctaaaagg gaaggggcgc ctatcctgta atcacatgac 240
ttgcttcacc ttgtcaatca cttagaagat tcaactctct taccctgcc ccttgtcttg 300
tatgcaataa atatcagtga cccagccgt tcaggggcac tactgggtct cgcgtcttga 360
tggtagtggg cccccgggc c                                     381

```

<210> 39

<211> 859

<212> DNA

<213> Human endogenous retrovirus

<400> 39

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tgtgggtgga ggattaccca ggtgccaaagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaaa aatagaata agaatagtca taatacaaat tagatataga gatgatcatg 120
gacaattagc aatcactatt aatcttttagc ttttaatat actctttgtt gcattactaa 180
tataacctag gaataaccgg tgggtatagg gtcagggtgct gaagggacat tgtgagaagt 240
gacctggaag gcaagagggtg agccctctgt cacgcccaca taaggggccgc ttgagggttc 300
cttgggtcaag tggtaacgcc agtgtctggg aatgcacccg ttaattagca gaccgcgaaa 360
gggagtctcc tttccttgga agagttgggg aacactctgc tccaccagct tcttgtggaa 420
ggctggatat tatccaggcc tgcgcgcagt catccggagg cttaaaccct tccctgtggt 480
gctgtgcttc aatgggtccc ctcttgtcc actttcatgc tccctccgta ctctggttc 540
ctctttgaag agcgcagtag atagcggtag aagaaatagt gaaagtctta aagtcttcga 600
tctttcttac aagtgcagag aagaaaacgc tgacatatgc tgcttccct ctctgcttcg 660
gtacctaaa agggaagggc cgcctatcct gtaatcacat gacttgcttc acctgtcaa 720
tcacttagaa gattcacccct ccttaccctg ccccttgtc ttgtatgcaa taaatatcag 780
tgaccccgagc cgttcagggc cactactggt ctccgcgtct tgatggtagt ggtcaccccg 840
gcccggtgt tttttcttt 859

```

<210> 40

<211> 396

<212> DNA

<213> Human endogenous retrovirus

<400> 40

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aaacccttcc ctgtggtgct gtgcttcaat ggtcccactc cttgtccact ttcattgctcc 60
tcccgtaactc ctggttccctc tttgaagagc gcagtagata gcggtagaag aaatagttaa 120
agtcttaaaag tcttcgatct tctttacaag tgcagagaag aaaacgctga catatgctgc 180
cttccctctc tgcttcggct acctaaaagg gaagggcgcgc ctatcctgta atcacatgac 240
ttgcttcacc ttgtcaatca cttagaagat tcacctcct taccctgccc cettgtcttg 300
tatgcaataa atatcagtga cccagccgt tcaggggccac tactggtctc cgcgtcttga 360
tggtagtggc caccgcggcc cagggtgttt tctctt 396

```

<210> 41

<211> 966

<212> DNA

<213> Human endogenous retrovirus

<400> 41

```

tgtgggtgga ggattaccca ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatgggttag aataagaata gtcataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attattaatc attagctttt aatattactc 180
tttgttgcat tactaatata acctaggaat aaccgggtggg tatagggtca ggtgctgaaa 240
ggacattggg agaagtgacc tagaaggcaa gaggtgagtc ttctgtcacg cccgcataag 300
ggttgcttga gggctccttg gtcaagtggg aacgcccggg tctgggaagg cacctgttac 360
ttagccgacc acgaaaggga gtctcctttc cttggaggag tcaggggcga ctctgctcca 420
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aaccctctcc tgtggtgctg tgcttcaatg ggcacactcc tcgtccactt tcatgttctc 540
cccatactcc tggtttctct ttgaagttcg tagtagatag tggtagaagg aatagggaaa 600
atcttaaagt gtttgatctt tcttataagt gcatagaaga aaacgctgac atatgctgcc 660
ttctctgtct gcttcagcta cctaagaggg aagggccccc tgtccagtga tcacgtgact 720
tgcttcacct tgtcaatcac ttagaagatt caccctcctt accctgcccc cttgtcttgt 780
atgcaataaa tatcagtga cccagccttt cggggccact taccggtctc cacgtcttgg 840
tggtagtggc ccccggggc cagctgtttt ctctttatct ctttgtcttg tgtcttattt 900
attacaatct ctctgtctccg cacacaggga gaacaccgc taagctccgt agggctggac 960
cctaca 966

```

<210> 42
 <211> 398
 <212> DNA
 <213> Human endogenous retrovirus

<400> 42
 aaacccctcc ctgtggtgct gtgcttcaat gggcacactc ctggtccact ttcattgttcc 60
 tcccatactc ctggtttctc tttgaagtcc gtagtagata gtggtagaag gaatagggaa 120
 aatcttaaag tggttgatct ttcttataag tgcataagaag aaaacgctga catatgctgc 180
 cttctctgtc tgcttcagct acctaagagg gaagggcccc ctgtccagtgc atcacgtgac 240
 ttgcttcacc ttgtcaatca cttagaagat tcacctcctc taccctgccc ccttgtcttg 300
 tatgcaataa atatcagtgc acccagcctt tcggggccac ttaccggtct ccacgtcttg 360
 gtggtagtgg tccccgggc ccagctgttt tctcttta 398

<210> 43
 <211> 938
 <212> DNA
 <213> Human endogenous retrovirus

<400> 43
 tgtgggtgga ggattacceca ggtgcccagg caagagactg aaggcacaaa ctgtttcagt 60
 ataataaaga aaatggttag aataagaata gtcataatac aaattagata tagagatgat 120
 catggacaat tatcaatcat tattataaac attattaatc attagctttt aatattactc 180
 tttgttgcat tactaatata acctaggaat aaccggtggg tatagggtca ggtgctgaag 240
 ggacattggg agaagtgacc tagaaggcaa gaggtgagtc ttctgtcacg cccgcataag 300
 ggttgcttga gggctccttg gtcaagtggg aacgccgggtg tctgggaagg cacctgttac 360
 ttagccgacc acgaaaggga gtctcctttc cttggaggag tcagggcaca ctctgtcca 420
 ccagcttctt gtggaaggct ggatattatc caggcctgcc cgcagtcac cggaggccta 480
 aacccctccc tgtggtgctg tgcttcaatg ggcacactcc tctgccaact tcatgttctc 540
 cccatactcc tggttcctct ttgaagtgcg tagtagatag tggtagaagg aatagggaaa 600
 atcttaaagt gtttgatctt tcttataagt gcatagaaga aaacgctgac atatgctgcc 660
 ttctctgtct gcttcagcta cctaagaggg aagggccccc tgtccagtga tcacgtgact 720
 tgcttcacct tgtcaatcac ttagaagatt caccctcctt accctgcccc cttgtcttgt 780
 atgcaataaa tatcagtgc cccagccttt cggkkcactt accggtctcc acgtcttggt 840
 ggtagtggtc ccccggccca gctgttttct ctttatctct ttgtcttggt tcttatttat 900
 tacaatctct cgtctccgca cacagggaga acaccgc 938

<210> 44
 <211> 396
 <212> DNA
 <213> Human endogenous retrovirus

<400> 44
 aaacccctcc ctgtggtgct gtgcttcaat gggcacactc ctggtccact ttcattgttcc 60
 tcccatactc ctggttctc tttgaagtcc gtagtagata gtggtagaag gaatagggaa 120
 aatcttaaag tggttgatct ttcttataag tgcataagaag aaaacgctga catatgctgc 180
 cttctctgtc tgcttcagct acctaagagg gaagggcccc ctgtccagtgc atcacgtgac 240
 ttgcttcacc ttgtcaatca cttagaagat tcacctcctc taccctgccc ccttgtcttg 300
 tatgcaataa atatcagtgc acccagcctt tcggkkcact taccggtctc cacgtcttggt 360
 tggtagtggg ccccggccc agctgttttc tcttta 396

<210> 45
 <211> 963
 <212> DNA

<213> Human endogenous retrovirus

<400> 45

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tgtgggcgaa agattaccta ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagttaa aataagaata gttataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attaatacatt agcttttaaat attactcttt 180
gttgctttac taatataacc taggaataac cgggtgggtat aggggtcagggt gttgacggga 240
tattgtgaga agtgacctag aaggcaagag gtgagccttc tgtcacgccc acataagggc 300
cgcttgaggg ctctttgggc aagtggtaac gccagtgtct gtgaaggcac ctgttactta 360
gcagaccgcg aaagggagtc tcctttcctt ggaggagtca ggggaacactc tgctccacca 420
gcttcttggtg gaaggctgga tattatctag gcctgcccgc agtcatctgg aggcctaaac 480
ccctccctgt ggtgctgtgc ttcagtgggc actctccttg tccactttca tgttcctccc 540
gtactcctgg ttctcttttg aagtctgtag tagatagcag tagaagaaat agtgaaagtc 600
ttaagttatt tgatctttct tataagtgc tagaagaaaa cgctgacata tgctgccttc 660
tctatctctg cgggtggctac ctaaaagggg agggccccct gtcccatgat catgtgactt 720
gtttcacctt atcacttaga agattcatcc tccttaacct gcgccccctc gtcttgatg 780
caataaatat cagcacgccc agtcgtttga ggccactgcc ggtctccgcg tcttggtggt 840
agtggtcccc cgggcccagc tattgtctct ttatctcttt gtcttggtgc tttatttatt 900
acaatctctt gtctctgcac acagggagaa cacctgctaa gcccgtagg actggaccct 960
aca 963
```

<210> 46

<211> 397

<212> DNA

<213> Human endogenous retrovirus

<400> 46

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aaacccctcc ctgtgggtgct gtgcttcagt ggtcactctc cttgtccact ttcattgttcc 60
tcccgtaact ctggttcctc tttgaagttc gtagtagata gcagtagaag aaatagtga 120
agtcttaaag tatttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
cttctctatc tctgcggtgg ctacctaaaa ggggaagggc cctgtccca tgatcatgtg 240
acttgcttca ccttatcact tagaagattc atcctcctta cctgcgccc cctcgtcttg 300
tatgcaataa atatcagcac gccagtcgt ttgaggccac tgccggtctc cgcgtcttgg 360
tggtagtggc cccccgggccc cagctattgt ctcttta 397
```

<210> 47

<211> 489

<212> DNA

<213> Human endogenous retrovirus

<400> 47

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tgttcaattc tttgccttct actttttaaac ttaacttcct cataaagcaa cctttttcaa 60
tcacctgctc cactctgact cattctgact acctgctcca cctgactca ttccgatcac 120
ctgatccact gtgactcatt ccgattaccc gctccaccct gactcattct gattctgatt 180
tctgctctg ccataaccat tttcccgc aaaccactca cctgtcact ctctttaaat 240
tagccaattg gaattagttt agcctgtgcg gtctaaccct agccaatagg ggactgacac 300
agcagcaggg gccacatgtg tcaggaataa gacccccctc cctccctgt ccagatgtgt 360
gtccaccatt gctccatctg tgagggcaca cccttctata gaagtaaatt gccttgctga 420
gaagaaaaaa aagaacattt tatattcaag tcctatttct tttgctgcac cgaaacttta 480
tttataaca 489
```

<213> Human endogenous retrovirus

<400> 45

```

tgtgggcgaa agattaccta ggtgccgagg caagagactg aaggcacaaa ctgtttcagt 60
ataataaaga aaatagttaa aataagaata gttataatac aaattagata tagagatgat 120
catggacaat tatcaatcat tattataaac attaatacatt agcttttaatt attactcttt 180
gttgctttac taatataacc taggaataac cgggtgggtat agggtcagggt gttgacggga 240
tattgtgaga agtgacctag aaggcaagag gtgagccttc tgtcacgccc acataagggc 300
cgcttgaggg ctctttgggc aagtggtaac gccagtgtct gtgaaggcac ctgttactta 360
gcagaccgcg aaagggagtc tcctttcctt ggaggagtca gggaacactc tgctccacca 420
gcttcttggt gaaggctgga tattatctag gcctgcccgc agtcatctgg aggcctaaac 480
ccctccctgt ggtgctgtgc ttcagtgggc actctccttg tccactttca tgttcctccc 540
gtactcctgg ttctcttttg aagtctgtag tagatagcag tagaagaaat agtgaaagtc 600
ttaaggtatt tgatctttct tataagtgc tagaagaaaa cgctgacata tgctgccttc 660
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gcttcacctt atcacttaga agattcattc tccttaacct gcgccccctc gtcttgatg 780
caataaatat cagcacgccc agtcgtttga ggccactgcc ggtctccgcg tcttggtggt 840
agtggtcccc cgggcccagc tattgtctct ttatctcttt gtcttggtgc tttatttatt 900
acaatctctt gtctctgcac acagggagaa cacctgctaa gcccgtagg actggaccct 960
aca
963

```

<210> 46

<211> 397

<212> DNA

<213> Human endogenous retrovirus

<400> 46

```

aaacccctcc ctgtgggtgct gtgcttcagt ggtcactctc cttgtccact ttcattgttcc 60
tcccgtaact ctggttcctc tttgaagttc gtagtagata gcagtagaag aaatagtga 120
agtcttaaag tatttgatct ttcttataag tgcatagaag aaaacgctga catatgctgc 180
cttctctatc tctgcggtgg ctacctaaaa gggaagggcc cctgtccca tgatcatgtg 240
acttgcttca ccttatcact tagaagattc atcctcctta cctgcgccc cctcgtcttg 300
tatgcaataa atatcagcac gccagtcgt ttgaggccac tgccggtctc cgcgtcttgg 360
tggtagtggc cccccgggccc cagctattgt ctcttta
397

```

<210> 47

<211> 489

<212> DNA

<213> Human endogenous retrovirus

<400> 47

```

tgttcaattc tttgccttct actttttaaac ttaacttcct cataaagcaa cctttttcaa 60
tcacctgctc cactctgact cattctgact acctgctcca cctgactca ttccgatcac 120
ctgatccact gtgactcatt ccgattaccc gctccaccct gactcattct gattctgatt 180
tctgctctg ccataaccat tttcccgcc aaaccactca cctgtcact ctctttaaat 240
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489

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